

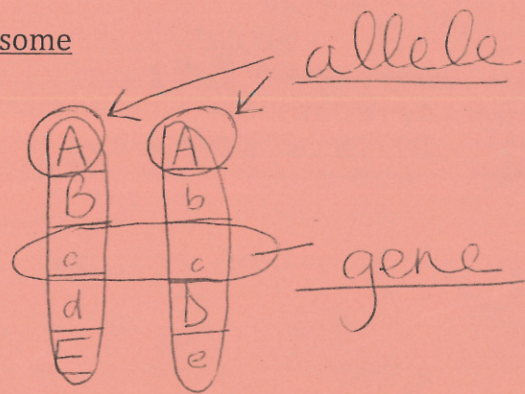
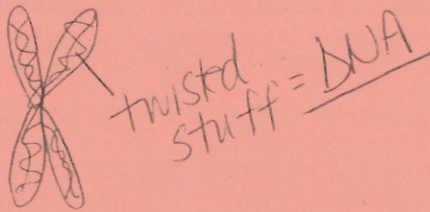
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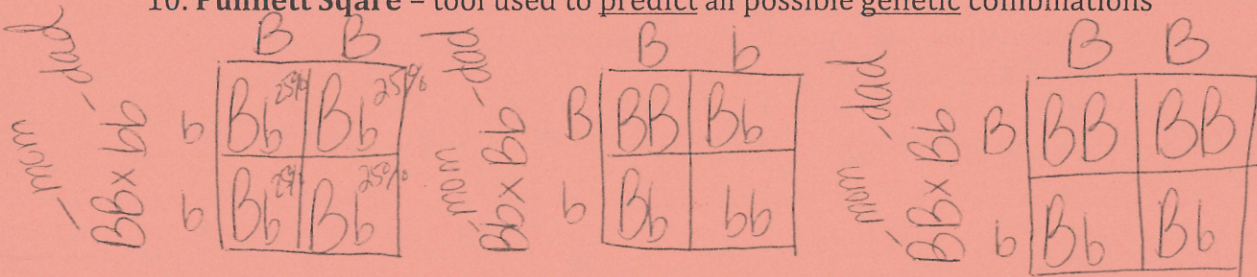
Period:

Genetics/Meiosis/DNA Unit

1. **heredity** -- passing of traits from generation to generation
2. **examples of traits** -- blue eyes, brown hair
3. **genetics** -- study of how genes are passed from generation to generation
4. **Gregor Mendel** -- father of genetics; used pea plants to study genetics
 - 1st experiment -- performed pea plant crosses for 7 different traits
5. **offspring** -- 1st generation from cross
6. **genes** -- sections of DNA and protein on a chromosome
7. **alleles** -- different forms of a gene



8. **dominant** -- allele that is strongest (capital letter)
9. **recessive** -- allele that is hidden (lowercase letter)
10. **Punnett Square** -- tool used to predict all possible genetic combinations



11. **probability** -- mathematical chance that an event will occur
12. **genotype** -- trait displayed (BB, Bb, bb)
13. **phenotype** -- organism's appearance (brown, blonde, or black hair)

14. **heterozygous** -- different alleles (Bb) synonym -- hybrid

15. **homozygous** - same alleles (BB, bb) synonym -- pure

Genes still a mystery! Must understand **REPRODUCTION!**

Two types:

1. **asexual reproduction** - 1 parent cell needed to produce identical cells or copies
2. **sexual reproduction** - 2 parent cells join together to form new individuals
 - c. **parent cells** = sex cells
 - d. **meiosis** - cell division that produces sex cells (sperm or egg)
 - i. females receive 2 X's
 - ii. males receive 1 X and 1 Y

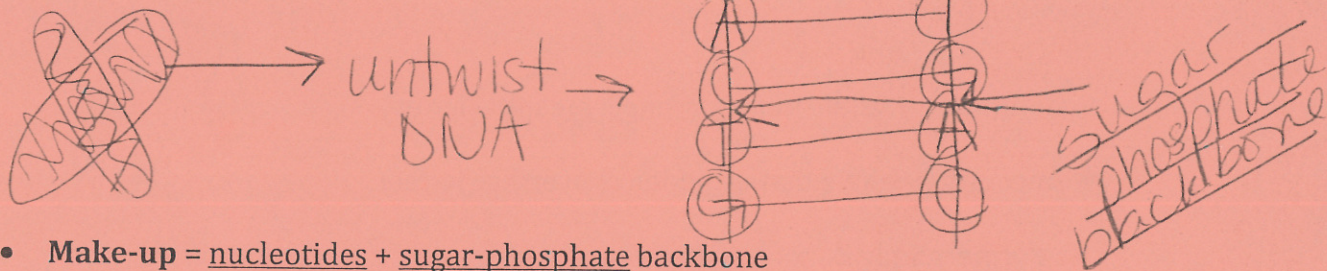
Genes & DNA

Genes must:

1. supply instructions for cell processes and building cell structures
2. be able to be copied

Genes made of DNA and protein

DNA Structure = double helix



- **Make-up** = nucleotides + sugar-phosphate backbone
 - **Nucleotides** = adenine, thymine, guanine, and cytosine
 - **A** pairs with T
 - **C** pairs with G
- **To copy**, must split in half

How DNA Works:

- Reads like a book
- 3 nucleotides code for an amino acid
 - Amino acids form proteins to give us traits

Problems with DNA:

- **mutations** - change in order of nucleotides in DNA
 - **base pair replaced, base pair added, base pair removed**
- Mutations lead to genetic diseases (Down syndrome)

Ways to get around gene issues!

1. **Pedigrees** - tools for tracing a trait through generations of the family
2. **Selective breeding** - mating organisms with desired traits to receive the desired gene
3. **Genetic engineering** - transfer genes from one organism to another
4. **Cloning** - creating an exact copy

Pedigree symbols:

O - female
□ - male
— - married together

┌ — children
└ —
— // — divorce ^{separated}
└ — twins

Pedigree Creation: